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OPERATIONALIZING AND INTEGRATING SPACE:  
BRIDGING THE CULTURAL BARRIERS

by

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A Research Report Submitted to the Faculty

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14. ABSTRACT This paper examines the evolution of space support and how space support has contributed to the operationalization and integration of space systems into warfighting roles, specifically at the tactical level of operations. The paper also demonstrates that the cultural mindset of the Air Force is shaped by our association with weapon systems (self-serving elitism) and not with the mission. These cultural mindsets or barriers influence the Air Force's capability to integrate new missions to support the Air Force vision. The thesis of this paper contends that failure on the part of the Air Force to recognize and exploit the critical capabilities space provides to warfighting is driven by cultural barriers. These cultural barriers inhibit the Air Force's efforts to fully operationalize and integrate space into theater-level operations. To defend this argument, this paper will define and analyze space contributions to theater-level operations by examining the AFSST concept of operations and successes and failures experienced during its evolution since Operation Desert Storm. The thesis will deal with two fundamental arguments. First, the most successful attempts at integrating and operationalizing space are making them organic within the theater-levels (i.e. permanent space personnel expertise and equipment located in theater with the NAFs and MAJCOMs). This will be illustrated by examining one of the most fundamental operational aspects of space; the AFSST. Secondly, this paper will demonstrate that failure to fully integrate space support was the result of many failed methodologies the Air Force implemented to help bridge some of the cultural barriers. While some of the methodologies were necessary in doctrinally defining and developing an applicable policy on use of space, the overarching strategy falls short of focusing on control and exploitation of space, which is part of the mission of the Air Force. This debate will shape the future of the Air Force and develop the framework on how we will fight future wars and where weapon system acquisition and modernization efforts should be focused. While the future of how engagements will be fought is still largely undetermined, one truth remains clear; space will play a key role as either a direct force applier or continue in the role as a force enabler or multiplier. The recommendations of this paper offer the Air Force several courses of action to consider in making space culturally acceptable and promoting the capabilities space has to offer the warfighting component of the Air Force. These efforts must include; more emphasis on integrated operations; cooperative partnering in planning, programming and budgeting; concerted educational efforts at all levels within the Air Force; and a more equitable mix of senior leadership (especially at the 4-Star level) reflecting all interest areas within the Air Force. The key to surviving in the modern era demands we adopt a different approach to creating our 'vision' by ensuring leadership is representative of all interests in the Air Force and the focus is on 'the control and exploitation of air and space', not the weapon systems.					
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## *Preface*

Doctrinally, there has been significant debate since the Gulf War on how to best integrate space into the realm of theater-level operations and make it a warfighting component. This debate is intriguing and has raised a level of concern in the Air Force as to what the future direction will hold both operationally and culturally. I also wanted to use this opportunity to view operations from both an Air Force culture perspective and how well the Air Force and Air Force Space Command (AFSPC) have accomplished their objectives of operationally integrating space. I use an examination of Air Force Space Support Teams (AFSST), because it demonstrates how well the Air Force can operationally integrate space as a warfighting asset.

While this paper examines operationalization and integration of space, there is a larger lesson to be emphasized to all Air Force members. Our service culture should be defined by people and not by weapon systems. We need to look to the future now and breakdown some of the traditional barriers of self-serving weapon systems and explore a more integrated approach to operations in the Air Force. If our own history has taught us nothing else, it should be that we need to always keep an open mind to the endless opportunities and capabilities of all facets of our mission, and that the main objective is serving the nation and not our own institution. The specific roadmap for the future of the Air Force will depend on cooperation and common purpose as our key to success and possibly our existence as a service. It is my hope that all members of the larger Air Force

community take the opportunity to reflect on how we view our service culture through this paper.

I wish to extend a special thanks to Lt Col Ed Bergemann for his valuable advice and guidance on keeping me focused with this effort. A special note of thanks to Majors Sam Epperson and Brian Pletcher and Captain Scott Traxler in helping me collect information on subject matter that has limited documented reference. I would also like to recognize Maj General Robert C. Hinson (HQ ADSPC/DO) for his continued visionary leadership of bringing an operational mindset to AFSPC and helping bridge some of the cultural stereotypes. And most importantly, my thanks to my wife Deanna for her continued support in my Air Force career.

*“Identity in the Air Force has become associated with a specific airplane rather than the institution or military art, with a resulting weaker sense of community than the other services.”<sup>1</sup>*

#### **Notes**

<sup>1</sup> Carl H. Builder, *The Icarus Syndrome*. Transaction Publishers, New Brunswick, 1994, 6.

## *Abstract*

This paper examines the evolution of space support and how space support has contributed to the operationalization and integration of space systems into warfighting roles, specifically at the tactical level of operations. The paper also demonstrates that the cultural mindset of the Air Force is shaped by our association with weapon systems (self-serving elitism) and not with the mission. These cultural mindsets or barriers influence the Air Force's capability to integrate new missions to support the Air Force vision.

The thesis of this paper contends that failure on the part of the Air Force to recognize and exploit the critical capabilities space provides to warfighting is driven by cultural barriers. These cultural barriers inhibit the Air Force's efforts to fully operationalize and integrate space into theater-level operations.

To defend this argument, this paper will define and analyze space contributions to theater-level operations by examining the AFSST concept of operations and successes and failures experienced during its evolution since Operation Desert Storm. The thesis will deal with two fundamental arguments.

First, the most successful attempts at integrating and operationalizing space are making them organic within the theater-levels (i.e. permanent space personnel expertise and equipment located in theater with the NAFs and MAJCOMs). This will be illustrated by examining one of the most fundamental operational aspects of space; the AFSST.

Secondly, this paper will demonstrate that failure to fully integrate space support was the result of many failed methodologies the Air Force implemented to help bridge some of the cultural barriers. While some of the methodologies were necessary in doctrinally defining and developing an applicable policy on use of space, the overarching strategy falls short of focusing on control and exploitation of space, which is part of the mission of the Air Force.

This debate will shape the future of the Air Force and develop the framework on how we will fight future wars and where weapon system acquisition and modernization efforts should be focused. While the future of how engagements will be fought is still largely undetermined, one truth remains clear; space will play a key role as either a direct force applier or continue in the role as a force enabler or multiplier.

The recommendations of this paper offer the Air Force several courses of action to consider in making space culturally acceptable and promoting the capabilities space has to offer the warfighting component of the Air Force. These efforts must include; more emphasis on integrated operations; cooperative partnering in planning, programming and budgeting; concerted educational efforts at all levels within the Air Force; and a more equitable mix of senior leadership (especially at the 4-Star level) reflecting all interest areas within the Air Force. The key to surviving in the modern era demands we adopt a different approach to creating our “vision” by ensuring leadership is representative of all interests in the Air Force and the focus is on “the control and exploitation of air and space”, not the weapon systems.

## **Chapter 1**

### **Introduction**

*With the release of Global Engagement: A vision for the 21<sup>st</sup> Century, the Air Force has made a major commitment to the role of space in our future. Our goal is to eventually evolve from an air and space force, which we call ourselves today, into a space and air force. We must move beyond the stovepipes of separate space and air capabilities in operations to operations that are fully integrated and fully interwoven<sup>1</sup>.*

General Michael E. Ryan

### **Background**

The role and use of space power in conflict today and in the future continues to be a contentious issue of debate within the Air Force. One of the critical issues on the Air Force's agenda is how best to integrate and operationalize space. This debate is predicated on the Air Force's Long Range Plan (LRP) and "Global Engagement" vision of expanding air and space capabilities.<sup>2</sup> The new capabilities created during this integration bring pressures to bear on our policy, strategy, roles and missions, doctrine, operational concepts and force structure. Space capabilities are not likely to remain simply as an additive or enhancement to atmospheric capabilities, but will ultimately compete within the Air Force's integrated system-of-systems architecture to satisfy the full range of Air Force missions and tasks.<sup>3</sup>

Doctrinally, the debate since the Gulf War, fought under the operational name Desert Storm, focuses on how best to integrate space into the realm of theater-level operations and make it a warfighting component. Even though the Air Force is the lead agency for space, space systems compete for aircraft roles and missions, posing difficult tradeoffs in budgets and force structure. In the absence of a larger, integrating vision, space and air become competing factions.<sup>4</sup> A major aspect of this debate is how to effectively influence a cultural change in the Air Force to accept and integrate contributions of space as a warfighting capability. By examining the Air Force Space Support Team (AFSST) evolution and concept of operation, this paper will determine how well the Air Force has operationally integrated space as a warfighting asset and how cultural mindsets of associating with a weapon system shape the doctrinal shift to accepting an aerospace force.

## **Thesis**

The thesis of this paper contends that failure on the part of the Air Force to recognize and exploit the critical capabilities space provides to warfighting is driven by a cultural barrier. This resistance in making a cultural shift has inhibited efforts to fully operationalize and integrate space into theater-level operations. To support the thesis, this paper argues two points.

First, the most effective method to integrate and operationalize space is to make them organic within the theater-levels (i.e. permanent space personnel expertise and equipment located in theater with the NAFs and MAJCOMs). This will be illustrated by examining one of the most fundamental operational aspects of space; the AFSST. This point also falls in line with current Air Force Doctrine Document 2-2, which states, “as

the Air Force moves to more integrated aerospace operations, reliance on theater support teams will diminish as space specialists are assigned to permanent duty on Numbered Air Force staffs.”<sup>5</sup>

Secondly, this paper will demonstrate that failure to fully integrate space support was the result of many failed methodologies the Air Force implemented to help bridge some of the cultural barriers. While some of the methodologies were necessary in doctrinally defining and developing an applicable policy on use of space, the overarching strategy falls short of focusing on control and exploitation of space, which is part of the mission of the Air Force. While space operations have proven their capability to contribute to warfighting, its contributions to enabling and someday directly applying force to major theater war conflicts are vastly misunderstood or not fully recognized. Two fundamental premises help define these arguments.

First, the AFSST provides an excellent example to model future integration and operationalization efforts for space. The Air Force can draw many lessons from this experience to bridge cultural gaps and more effectively chart the future of a “One Air Force, One Team” concept.

The second premise draws upon the continued debate of space asserting itself as an operational mission and draws upon arguments proposed by Carl Builder from his book “The Icarus Syndrome”. Mr Builder argues that:

“However the mission and, hence, the vision of the Air Force be defined or declared, they will only be deeds by leaders...It is the deeds, not the words, that ultimately define the vision. If the leadership is perceived to represent special interests within the institution, then those interests, even more than the institutions mission or mission statement, will be seen by many as shaping the future.”<sup>6</sup>

The history of the Air Force demonstrates that our association with weapon systems (bombers and fighters) defines our culture. As a result of Desert Storm, the fighter community largely defines the current Air Force culture. The emergence of space and its influence on the outcomes of war are challenging this cultural mindset. The Air Force needs to look beyond defining itself by weapon systems and define itself by capabilities across the spectrum.

### **Preview of the Argument**

Chapters two through five of this paper introduce the evolution of the AFSST and trace its development since the Gulf War and provide background by examining some operational concepts. Finally, the paper will use defined integration areas as identified in the *Air Force Implementation Plan: Integrating and Operationalizing Space into Air Force Operations (herein referred to as the Implementation Plan)*<sup>7</sup> to provide a measure of effectiveness in operationalizing and integrating space.

Specifically, chapter two provides a historical review of how ad hoc space applications in operation Desert Storm resulted in doctrinal change. This doctrinal change focused on the requirement to provide space expertise in theater-level operations and examine methods to more effectively integrate and operationalize space at the tactical level.

Chapter three describes the current operational concept of AFSST. This description of operations provides the baseline to analyze and evaluate what objectives have been accomplished and what shortfalls exist in integrating and operationalizing space. This review illustrates how the real focus is on people who operate and adapt these systems for warfighting use.

Chapter four analyzes and evaluates defined integration areas set forth in the Implementation Plan to determine measures of effectiveness in integrating and operationalizing space support. It also addresses some shortfalls the Air Force experienced in the integration effort. The analysis and evaluation defines problems in fully integrating and operationalizing space and some of the cultural barriers that have inhibited this integration.

Finally, chapter five provides recommendations on how best to integrate and operationalize space and what aspects of space the Air Force senior leadership must recognize to change cultural mindsets.

The importance of reviewing the AFSST experience is that it provides space an operational legacy to warfighting, and more importantly legitimizes space personnel and systems as warfighting assets. This legacy can help close the cultural gap by demonstrating how space fulfills the Air Force mission and vision statements. The next chapter addresses how this evolved historically.

### Notes

<sup>1</sup> James Kitfield, "The Space and Air Force," *Air Force Magazine*, February 1998, 38.

<sup>2</sup> Air Force Space Command Directorate of Operations. *Air Force Implementation Plan: Integrating and Operationalizing Space into Air Force Operations*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1997, 4.

<sup>3</sup> *Ibid.*, 4.

<sup>4</sup> Carl H. Builder, *The Icarus Syndrome*. Transaction Publishers, New Brunswick, 1994, 6.

<sup>5</sup> Air Force Doctrine Center. *Air Force Doctrine 2-2*. Maxwell AFB, AL: Air Force Doctrine Center, 23 August 1998, 27.

<sup>6</sup> *Ibid.*, 226.

<sup>7</sup> The *Air Force Implementation Plan: Integrating and Operationalizing Space into Air Force Operations* outlines six defined integration areas the Air Force is using to facilitate integration efforts. These defined integration areas are: Doctrine for Integrated Air and Space Power, Tactics to Exploit Space Capabilities, Resource Allocation for Weapon System Concept Design, Development and Procurement Operational Plans, Education,

## **Notes**

Training and Exercises and Organization and Manpower. This paper focuses only on doctrine, resource allocation, education training and exercises and organization and manpower as a measurement of effective integration.

## **Chapter 2**

### **Process Evolution**

*Desert Storm...was a watershed event in military space applications because for the first time, space systems were both integral to the conflict and critical to the outcome of the war.<sup>1</sup>*

General Thomas Moorman, Jr.

### **Desert Storm**

The military operational use of space was defined in 1966 with the launch of the Defense Satellite Communication Program satellites.<sup>2</sup> However, it was not until Operation Desert Storm that space systems were able to make broad, critical contributions to the outcome of a conflict.<sup>3</sup>

Military space systems prior to Desert Storm focused primarily on strategic rather than tactical requirements.<sup>4</sup> Although space systems had been employed in conflicts from Vietnam to Urgent Fury (Grenada), El Dorado Canyon (Libya) and Just Cause (Panama), these operations involved only portions of the military space community for a relatively brief time.<sup>5</sup> Employment during these operations was incomplete and often ad hoc. Desert Storm by contrast involved the full arsenal of military space systems. Desert Storm represented the first major trial by fire for space forces, whereby military space systems could fulfill their role as crucial “force multipliers.”<sup>6</sup>

Desert Storm is lauded as the first space war and began the redefinition of how to doctrinally apply airpower through a new medium. In order to meet this new challenge of supporting the warfighter, Air Force leaders realized they must focus the effort to modernize space infrastructure, continue technical improvements to space systems, and extend space awareness throughout the Air Force and the armed forces as a whole.<sup>7</sup>

Space success in Desert Storm included the ability to influence the war and help save lives by providing intra and inter theater communications, weather for mission planning, early warning for Scud Missile Launches, navigation aids and of course intelligence. However, the integration and exploitation of these capabilities did identify some limitations.<sup>8</sup> Above all, analysts realized that in spite of mounting the largest contingent of space-based forces to date, these systems were insufficiently designed for tactical use. It was also noted that ground personnel often lacked the necessary equipment and training to fully exploit space capabilities.<sup>9</sup> In many ways, what really made space support work during Desert Storm was the impressive ability of space personnel to adapt their systems for the tactical warfighter.<sup>10</sup>

During operation Desert Storm, the lack of space knowledge in the combat forces occasionally resulted in less-than-optimal tasking of space systems and the slow dissemination of information.<sup>11</sup> The problem during Desert Storm was the Air Force and specifically Air Force Space Command had trained virtually no one to integrate with the rest of the Air Force to plan and facilitate theater-level operations. To correct this deficiency, the solution included the creation of several organizations such as the Space Warfare Center (SWC), Fourteenth Air Force (14AF), 76th Space Operations Squadron (76 SOPS) and 11th Space Warning Squadron (11 SWS). Also, rotational billet

arrangement initiatives for space personnel were created for Air Combat Command (ACC), Air Mobility Command (AMC) and Air Force Special Operations Command (AFSOC). The concept called for creation of theater-level operations and expertise within the space community and migration of this experience throughout the Air Force. It was recognized at the on-set the maturity of theater space level experience would require a number of years to develop and the MAJCOM evolution would be a slow process.

## **Space Support**

The Air Force made a solid corporate commitment to integrate space throughout the Air Force because Desert Storm provided the needed catalyst in the operationalization of military space systems. Corporately, a number of initiatives were introduced that included: incorporating space into Air Force doctrine; establishing personnel policies to stimulate the cross flow of space-trained people between Air Force Space Command and other combatant commands; and expanding space education in the Air Force professional military curriculum.<sup>12</sup>

Operationally, it became universally understood space forces provided critical contributions to the operational and tactical levels of warfare. What was not understood was what capabilities space could bring to the warfighter and how best to employ these systems at the theater-level of operations. General Ronald R. Foglemen, then Chief of Staff of the Air Force stated, “We need a (Space) interface with the warfighter...”.<sup>13</sup> These limitations generated the impetus to look at developing an organization that could provide the required space expertise to the theater-level. This was truly the first attempt to operationalize space.<sup>14</sup>

Operation Desert Storm illustrated the capabilities of national and military space systems to enhance tactical combat operations by providing vital services and information, which clearly helped lead to the coalition's overwhelming success. This newly discovered tactical capability became the central focus on doctrinal and operational applications. In 1992, General Merrill McPeak, then Chief of Staff of the Air Force, chartered a blue ribbon panel (herein referred to as the Moorman Panel) led by General Thomas S. Moorman, Jr. to address space roles and missions. Some of the significant findings from the panel concluded that space represented the decisive edge for the warfighter and that the Air Force should reexamine all training, education and personnel policies in order to promote a better understanding of space among the aviation community as well as aviation needs among the space community. By far the most significant recommendation from the panel in regards to operational contributions was the belief that theater arrangements should find the Air Force Component Commander as the focal point for space support.<sup>15</sup>

Another significant finding from the Moorman Panel determined the Air Force was at a threshold of increasing space dependency. This need dictated integrating space expertise throughout the institution as a necessity.<sup>16</sup> In 1993, the Air Force implemented the Moorman panel's chief recommendation to integrate space across the Air Force. The Air Staff and Air Force Senior Leadership now faced a pair of initial tasks: First, assess the extent of tactical utility in the existing infrastructure of satellites, personnel, and communication links. Second, affect a cultural change within the blue-suit community. Culturally, the internal Air Force division between operational warfighters in the theaters and space personnel acted as a barrier. Those in the Air Force who came up through the

ranks as fighter, bomber or tanker pilots were at odds with the space experts who had long focused on preparing for and preventing apocalyptic conflict (i.e. nuclear war).<sup>17</sup>

Throughout the debate since Desert Storm, space forces critical contributions to the operational and tactical levels of warfare were recognized, but not widely understood. To mitigate this problem and provide a tactical solution, the space support team concept was developed. Space support became the recognized operational concept for theater operations as an essential warfighting concept. Air Force Space Command identified a need to provide space system expertise to the Air Component Commander in the Air Operations Center (AOC). This space support would conduct theater support operations. It was defined as, “The conduct of space combat support operations to provide the products and services available from space forces to support the warfighting CINCs and Joint Task Force (JTF) commanders in the preparation and execution of their missions.”<sup>18</sup> Thus began the evolution of theater-level space support and development of a concept of operations.

## **Concept of Operations**

Air Force Space Command took the initiative to stand up the 76 SOPS at Schriever Air Force Base, Colorado to develop Air Force Space Support Teams (AFSST). The squadron took responsibility to train, organize and equip forces to provide space support to theater CINCs in the planning and execution of theater-level operations. Specifically, the 14<sup>th</sup> Air Force commander was assigned as the service component commander designated to manage, integrate, and direct Air Force space forces. The 14<sup>th</sup> Air Force commander provides space support to theater force commanders as required, or when requested. Currently, theater support teams augment the Joint Forces Air Component

Commander (JFACC) staff to provide expertise in support of planning and execution of air and space taskings or missions.<sup>19</sup>

Operationally, space support was slowly integrated into theater-level operations through an aggressive cross-flow program of space personnel integrated in staff positions within the unified command staffs and their components to help promote understanding of space and bridge cultural barriers. Individuals with national and military space expertise provided the knowledge to employ and exploit space power.

The development and institutionalization of AFSST teams was the first critical step in operationalizing space and continues to be so today. The AFSST deploys to support regional planning staffs when requested. The AFSST provides space power expertise and assists in planning and execution functions. Additionally, liaison channels between USCINCSpace and the theater CINCs normally work through the JFACC to provide space support. These efforts are fundamental in the success stories of integrating and operationalizing space.

The Air Force's attempts to integrate aerospace operations to fulfill the doctrinal vision of less reliance on theater support teams focuses on assigning space specialists to permanent duty on numbered air force staffs. The creation of AFSST was just the beginning. The AFSST provided a doctrinal foothold for space as a warfighting component, because it did not focus on systems, but rather "space people". Simply stated, "A key element of space power is the people who operate, maintain or support these systems. Space provides a commanding view of operations and provides an important military advantage."<sup>20</sup>

People and culture continue to be the defining elements for creating the operational mindset within the Air Force. The historical evolution of AFSST provides a unique opportunity to analyze how well space has commanded these elements to continue to make operational impacts within the Air Force and make space culturally acceptable.

Armed with a thorough understanding of operational development of space and the genesis of space support, the next chapter reviews the operational aspects of space support.

### Notes

<sup>1</sup> Air Force Doctrine Center. *Air Force Doctrine 2-2*. Maxwell AFB, AL: Air Force Doctrine Center, 23 August 1998, 25.

<sup>2</sup> David N. Spires, *Beyond Horizons: A Half Century of Air Force Space Leadership*. US Government Printing Office, 1997, 140. This marked the beginning of operational space success utilizing strategic assets. Space was also a key contributor in the victory of the Cold War.

<sup>3</sup> Lieutenant General L. Thomas Moorman, Jr. USAF, *The Future of Air Power in the Aftermath of the Gulf War--Space: A New Strategic Frontier*. Maxwell AFB, AL: Air University Press, July 1992, 235.

<sup>4</sup> David N. Spires, *Beyond Horizons: A Half Century of Air Force Space Leadership*. US Government Printing Office, 1997, 244.

<sup>5</sup> Ibid., 244.

<sup>6</sup> Ibid., 244.

<sup>7</sup> Ibid., 260.

<sup>8</sup> Ibid., 245.

<sup>9</sup> Ibid., 260.

<sup>10</sup> Ibid., 260.

<sup>11</sup> Major James Perales, "Integrating Space into the Fight." *Space Tactics Bulletin*, Space Warfare Center, Winter 97/98, 14.

<sup>12</sup> Lieutenant General L. Thomas Moorman, Jr. USAF, *The Future of Air Power in the Aftermath of the Gulf War--Space: A New Strategic Frontier*. Maxwell AFB, AL: Air University Press, July 1992, 237.

<sup>13</sup> 76 Space Operations Squadron. "The Air Force Space Support Team (AFSST)," *Mission Briefing*, Schriever AFB, CO: 76<sup>th</sup> Space Operations Squadron, 29 Jan 96, slide 3.

<sup>14</sup> It may be argued space has been operational at the strategic-level since 1966, this context refers only to tactical and theater-level operations.

<sup>15</sup> David N. Spires, *Beyond Horizons: A Half Century of Air Force Space Leadership*. US Government Printing Office, 1997, 277.

## Notes

<sup>16</sup> Major General William G. Jones USAF (ret), *White Paper on Space in the USAF*. 1997, 17.

<sup>17</sup> David Lynch, "Spacepower Comes to the Squadron," *Air Force Magazine*, September 1994, 67.

<sup>18</sup> Air Force Space Command, *Concept of Operations for the Air Force Space Support Teams*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1 August 1997, 1.

<sup>19</sup> Air Force Doctrine Center. *Air Force Doctrine 2-2*. Maxwell AFB, AL: Air Force Doctrine Center, 23 August 1998, 5.

<sup>20</sup> *Ibid.*, 1.

## **Chapter 3**

### **Space Support Operations**

*The military value of space systems to the commander is best measured on the battlefield. The full impact of space systems can only be realized when CINCs and their component commanders know what space can do, how they can get it, and how they can use it.<sup>1</sup>*

General Charles Horner

This chapter discusses the operational concept of space support. It is important to note this discussion serves as a foundation for Chapter 4 to see if the Air Force accomplished its objectives to operationalize and integrate space as defined by the Air Force Implementation Plan: Integrating and Operationalizing Space into Air Force Operations (Implementation Plan). This chapter also provides the link to identifying any areas the Air Force has failed to fully integrate. Specifically, this chapter reviews the space support mission, how space support is trained, organized and equipped, how it functions operationally and where future operations are headed.

#### **The Implementation Plan**

One of the key tools this paper utilizes as a measure of effectiveness of space support is the Implementation Plan. This plan was a direct tasking from CORONA FALL 1996. The plan is designed to document specific actions to integrate space in the Air Force. Headquarters Air Force Space Command is the lead MAJCOM in this effort with

Headquarters United States Air Force Directorate of Plans and Programs as the office of controlling responsibility. The Implementation Plan directs a short term focus, 1 to 3 years, and directs critical actions that will be taken by each participating MAJCOM (ACC, AMC, AFSPC, AFLC, AFSOC, USAFE, PACAF) to successfully integrate space operations and capabilities throughout all aspects of Air Force operations. This document also provides a starting point as the Air Force transitions to an air and space force on the evolutionary course to a space and air force. To adequately address integration of space operations into Air Force operations, AFSPC identified six essential integration areas. Each MAJCOM would track and report on their respective progress in accomplishing these objectives. They are:

1. Doctrine for Integrated Air and Space Power
2. Tactics to Exploit Space Capabilities
3. Resource Allocation for Weapon System Concept Design, Development and Procurement
4. Operational Plans
5. Education, Training and Exercises
6. Organization and Manpower

To effectively gauge integration and operationalization of space into the Air Force, a measurement criterion needs to exist. These integration areas provided an exceptional baseline to use in gauging this effectiveness. This paper focused specifically on doctrine, resource allocation, education training and exercises and organization and manpower as a measurement of effective integration. The mutually agreed upon defined integration areas will be used to define space support teams in Chapter 3 and as an analysis and evaluation tool to measure effectiveness in integrating space in Chapter 4.<sup>2</sup>

## **Mission**

Space support teams aid the Air Component Commander in the effective use of space system capabilities and applications to support air operations. Teams normally deploy to the Air Operations Center (AOC), although this will be dependent on the needs and desires of the respective theater commander. The Air Force Space Support Team (AFSST) wartime tasking supports two near simultaneous major theater wars, and includes a 24-hour deployment response time to worldwide contingencies as well as providing exercise support.<sup>3</sup>

The mission of AFSST is threefold<sup>4</sup>:

1. Augment theater force operations in support of air components worldwide.
2. Enhance “access to space” for warfighting by providing space system expertise, maintaining real-time status of space assets that support the air component, providing access to systems for space applications, and providing an interface with other space organizations supporting theater-level operations.
3. Prepare to deploy worldwide within 24-hours of tasking.

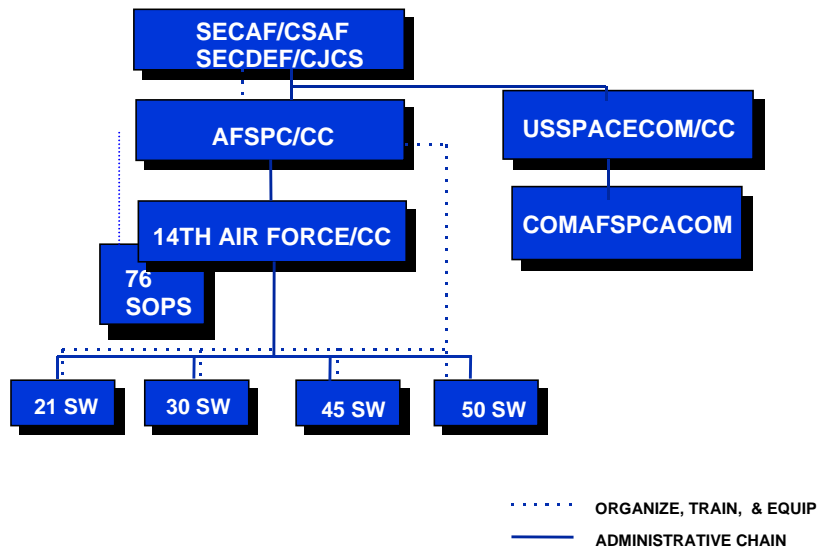
Space support to theater operations is steadily increasing, improving and becoming more important. It is the job of the AFSST to integrate these vital space capabilities into the theater campaign. The bottomline of space support is putting bombs on target and saving lives. Space systems are integral to accomplishing this. As executors of theater support operations, AFSST tailors support for each theater. Based on the requirements of the JFACC, AFSST works directly with the Combat Plans and Combat Operations Divisions in the AOC. Space support teams are very effective at utilizing space systems and their capabilities, and present significant force enhancement opportunities in a number of AOC functions including mission planning and targeting, search and rescue, theater ballistic missile defense, imagery collection and dissemination and satellite

communications.<sup>5</sup> Let's examine how AFSST is organized, trained and equipped to accomplish the mission.

### **Train, Organize and Equip**

United States Code, Title X (as amended through December 31, 1996) requirements outline how units should be trained, organized and equipped. This discussion is necessary to understand arguments put forth in chapter 4 and details some of the fundamental issues used in the analysis.<sup>6</sup>

The organizational structure of the AFSST is unique in the Air Force. Currently, AFSST organizationally falls under control of the 76 SOPS. The squadron is responsible for training, organizing support teams, and deploying the teams to theaters. The 76 SOPS parent organization is 14AF which is under AFSPC. CINCUSPACECOM has combatant command authority. The unique aspect of this relationship is the 76 SOPS reports directly to 14AF as the senior warfighting echelon and not to a wing. The 14AF is a level of command directly under USSPACECOM and is a tactical echelon providing operational leadership and supervision. The operational focus of 14AF ensures the readiness of assigned forces for deployment, employment and exercises. The Commander of Air Force Space Forces (COMAFSPACE) staff has a wide span of control to enhance communications between COMAFSPACE and joint or other component staffs.<sup>7</sup>



**Figure 1. AFSST Organization<sup>8</sup>**

Organizationally, the manpower mix for the 76 SOPS represents a broad spectrum of experience. The unit manning document reflects a strong mix of space experienced personnel interspersed with personnel that bring an understanding of tactical applications.<sup>9</sup>

Training team members for certification focuses on space capabilities and limitations and understanding theater-level operations. Training for the AFSST teams is conducted both internally through the 76 SOPS and externally through the Space Advanced Applications Course (SAAC).<sup>10</sup> These courses provide the requisite “orientation” training for permanent team members to certify them to perform team duties.

Some serious training deficiencies identified after Desert Storm required immediate Air Force attention. Some of the deficiencies included a lack of knowledge about overall space capabilities at all levels within the flying Combat Air Forces (CAF) and a shortage of space personnel who truly understood current tactical air employment. This deficiency resulted in the stand-up of the Space Division at the USAF Weapons School. Space

experts at the weapons school instruct the CAF on space systems capabilities and limitations, help the CAF define their space needs, and further the integration of space assets into warfighting by helping overcome some of the cultural barriers.<sup>11</sup> This training makes a significant difference to space support as a whole. Some of these weapon school graduates are channeled into the 76 SOPS and become team members and apply this tactical space experience to the theater. The weapons school has created a better understanding of what space brings to the warfighter.

Another significant opportunity for training is the space support teams participation in exercises. The 76 SOPS is an instrumental player in several key exercises and is projected to participate in many more in the future.<sup>12</sup>

Air Force Space Command ensures adequate funding exists to properly equip the 76 SOPS. Other MAJCOMs have agreed to provide necessary support to ensure space support units and/or space support teams resident within the MAJCOM or NAF staffs are properly equipped.<sup>13</sup> This support is necessary because AFSST actually deploys with equipment to the theater.<sup>14</sup>

## **Current Operations**

The 76 SOPS deploys an AFSST to aid the JFACC and ensure space systems are effectively used in the areas of command and control, communications, weather, navigation, tactical missile warning, and other areas to force multiply US and allied combat capabilities.

Currently, six teams are available to augment sponsoring MAJCOMs and NAFs in their roles to provide assigned forces to a theater CINC. Normal team composition is six members. This can vary depending on needs of the theater.<sup>15</sup>

Operationally, AFSST's conduct theater operations in support of the Air Component Commander in preparation for and implementation of Operation Plans (OPLAN) development, contingency and crisis operations and exercise support<sup>16</sup>. They also augment the JFACC's staff, but are not a substitute for that commander's staff. Their value as advisors is the knowledge they bring of space assets that support the particular theater and the ability to apply space expertise that is not currently resident on most air operations staff.<sup>17</sup>

When deployed, AFSST advises the AOC staff on operational considerations affecting space operations. The team advises the JFACC on the capabilities of supporting space forces, is current on status of space forces and is proactive in identifying space support problems and shortfalls. The AFSST interface internally and externally as necessary to identify and work spacepower application solutions.<sup>18</sup>

The focus of the AFSST is to provide tailored space support for theater commanders. Team members are knowledgeable of the theater OPLANs, Air Tasking Order (ATO) and the ATO cycle. The team works directly with combat operations and plans and also interfaces with supporting divisions such as weather, communications, intelligence and rescue. The space support role is defined as force enhancement because the AFSST provides the warfighter space assets at the right time and place. This is done through mission planning and targeting, search and rescue, Theater Missile Defense, imagery collection and dissemination, and satellite communications.<sup>19</sup>

The AFSST support may include, but is not limited to:<sup>20</sup>

- 1) Providing the JFACC with space operations assessment.
- 2) Monitoring the US and the rest of world space assets through a direct link to 14AF Space Operations Center (SOC).

- 3) Advising the JFACC on consequences of loss of space support, vulnerabilities of space and how Air Force Space Forces can assist in restoring that support
- 4) Recommending tactics to improve use of space capabilities in concert with air operations (coordinating imagery satellite overflight with target times or determine navigational accuracy for specific targets at specific times.
- 5) Identifying and recommending enemy space-related C4ISR (Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance) targets to C2 (Command and Control) warfare cell.
- 6) Providing an AOC liaison with Joint Space Support Team (JSST) to ensure a unified theater space effort.

## **The Way Ahead**

Space support teams provide basic or augmentation space expertise and equipment where appropriate. As in-theater space support experience grows, future AFSST augmentation will be tailored to meet the specific needs of the Air Component Commander. One specific example of augmentation already in place is in USAFE. The in-place Space Liaison Officers (SLO) are augmented by AFSST members in the AOC.<sup>21</sup>

The ultimate end-state as the Air Force moves to more integrated aerospace operations is space specialists assigned to permanent duty on Numbered Air Force staffs. This will eliminate the requirement for augmenting space support teams. Theaters can then rely on their own organic support from a team that is homegrown and familiar with regionalized operations. This organic support also bridges some of cultural barriers by integrating space in tactical operations and leads to acceptance by other warfighters.

In the future, the US may not have the opportunity for extended mobilization of military forces in preparation for war; therefore, space support for military forces involved in regional crisis and conflicts will initially be accomplished using currently deployed space forces. Additional space forces will be integrated into the theater commensurate with the requirements of the theater commander and available assets.<sup>22</sup>

This chapter has provided an operational overview of space support teams. This discussion serves as the baseline to assess the “effectiveness” in operationalizing space. This operational background will be used in the next chapter to chart operational effectiveness, not only for AFSST, but for universal applications as well.

## Notes

<sup>1</sup> Major James Perales, “Integrating Space into the Fight.” *Space Tactics Bulletin*, Space Warfare Center, Winter 97/98, 14.

<sup>2</sup> Air Force Space Command Directorate of Operations. *Air Force Implementation Plan: Integrating and Operationalizing Space into Air Force Operations*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1997, 3-4.

<sup>3</sup> Air Force Space Command, *Concept of Operations for the Air Force Space Support Teams*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1 August 1997, 3.

<sup>4</sup> Ibid., 3.

<sup>5</sup> 76<sup>th</sup> Space Operations Squadron, *AFSST Lesson Plan*, Schriever AFB, CO: 76 Space Operations Squadron, 13 Jun 1997, 2.

<sup>6</sup> United States Congress, House, Committee on National Security, *Title 10*. Washington D.C., 104<sup>th</sup> Congress, 31 December 1996, 807.

<sup>7</sup> Fourteenth Air Force, *A White Paper to Articulate COMAFSPACE’s Vision Command and Control of AFSPCAE Forces*. Vandenberg AFB, CA: Headquarters 14<sup>th</sup> Air Force, 20 April 1998, 11.

<sup>8</sup> Ibid, 11.

<sup>9</sup> Current AFSPC UMD shows authorization shortfalls in several positions until the fourth quarter of 2001 when all requested authorizations will be filled. Currently, there are six flights identified as AFSST. These flights reflect shortages ranging from 1-3 positions.

<sup>10</sup> The 76 SOPS currently conducts mission ready training for AFSST team members. In addition, all AFSST team members are required to attend the Space Advanced Application Course provided by the Space Warfare Center and contracted through BETAC Corporation. The SAAC gives members an overall introduction on all space systems, capabilities and limitations and how to apply these systems in a theater environment. This is a SCI-level course.

<sup>11</sup> Major James Perales, “Integrating Space into the Fight.” *Space Tactics Bulletin*, Space Warfare Center, Winter 97/98, 14.

<sup>12</sup> Currently, Headquarters Air Force Space Command Directorate of Operations Training Division is tracking all exercise participation and developing a lessons learned database to track and apply for both future exercises and real-world deployments.

<sup>13</sup> Air Force Space Command Directorate of Operations. *Air Force Implementation Plan: Integrating and Operationalizing Space into Air Force Operations*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1997, 4.

## Notes

<sup>14</sup> This equipment includes a Theater Support Operations Cell (TSOC), Global Positioning System (GPS) Receivers, INMARSAT Terminals, JDISS workstations and mobility equipment.

<sup>15</sup> Air Force Space Command, *Concept of Operations for the Air Force Space Support Teams*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1 August 1997, 3. Augmentation support is provided to Pacific Air Forces (PACAF), Central Air Forces (CENTAF) United States Air Forces Europe (USAFE), 8<sup>th</sup>/12<sup>th</sup> Air Force (Both under ACC, AMC and AFSOC).

<sup>16</sup> OPLAN support is confined to input provided to ANNEX N, which is the space support ANNEX.

<sup>17</sup> Air Force Space Command, *Concept of Operations for the Air Force Space Support Teams*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1 August 1997, 14.

<sup>18</sup> Ibid., 14.

<sup>19</sup> Ibid., 15.

<sup>20</sup> Ibid., 15.

<sup>21</sup> Ibid., 14.

<sup>22</sup> Air Force Doctrine Center. *Air Force Doctrine 2-2*. Maxwell AFB, AL: Air Force Doctrine Center, 23 August 1998, 22.

## Chapter 4

### Analysis and Evaluation of Operationalization of Space

*The profound impact of space technologies has only become evident in recent years. Six years ago, we fought what was called the first space-aided war in Desert Storm. Our space based capabilities were instrumental in the execution of the campaign that dismantled Iraq's military capability. Since then we have seen more success in integrating space into our operations in the Bosnia campaign where I can tell you first hand that space systems were vital. They afforded us precision targeting (tenet of persistence), and the capability to revisit these targets to avoid collateral damage and contributed to peace.<sup>1</sup>*

General Michael D. Ryan

This chapter examines documented areas for integration as defined in the Implementation Plan as a gauge to determine relative effectiveness/success in integrating and operationalizing space. The analysis in this chapter reviews these integration areas to determine where the Air Force achieved successful integration and also areas of shortfalls. The analysis examines manpower and experience, MAJCOM and NAF responsibilities and real-world and exercise deployment to illustrate some of the successes of integration and highlights where the Air Force has bridged cultural barriers. It also identifies shortfalls in manpower, training and equipment that continue to impede the cultural change process. This chapter only focuses on these selected integration areas because they produce the most significant impact to operations and possess the capability to positively influence cultural barriers. Let's begin the discussion by examining personnel.

## **Integration Area Success**

### **Manpower and Experience**

Since the Gulf War, a great deal of effort is dedicated to ensure that these space support teams from the 76 SOPS include the right mix of personnel and experience. Generally, through an aggressive cross-flow program, space personnel successfully integrate into staff positions within the unified command staffs and their components.<sup>2</sup> The creation of the Weapon School continues to grow and develop “operators”. These operators maximize the potential contributions of space to operational warfare by putting them at a point where they can best apply their space knowledge in a flying and fighting combat force and is instrumental to operationalizing space support.<sup>3</sup>

The weapons school and the integration of rated personnel with direct theater-level experience are significant factors in bridging cultural differences by educating space personnel on tactical air operations and establishing credibility among the flying community. We are on the right track with attempts to crossflow personnel and space personnel are making significant gains in shifting the cultural focus to combined air and space operations.

### **MAJCOM and NAF Responsibilities**

Some of the key efforts to integrate and operationalize space resulted from the Air Force’s efforts to seed the other MAJCOM and NAF staffs with space expertise led by AFSPACECOM. Integral to this effort was the conceptual and doctrinal effort developed from AFSST of growing organic space support within these staffs.<sup>4</sup> Space support has become a recognized operational concept for theater support operations and is considered an essential warfighting element that is being integrated into these staffs.<sup>5</sup>

The Air Force and its MAJCOMs considered and decided how to best organize for integrating space and determined organizational structures and manpower allocations appropriately. The Implementation Plan clarifies roles, missions and utilization of manpower across the MAJCOMs, which in turn may significantly alter the organization of several major commands.<sup>6</sup> This has resulted in some large gains in reducing cultural barriers.

One of the key success stories occurred during operation Joint Endeavor, when a USAFE space support team deployed to Vicenza in support of DENY FLIGHT and PROVIDE PROMISE. The team provided Multi-Spectral Imagery for drop zones, incorporated space annexes for peacekeeping operations and worked Global Positioning System (GPS) problems for search and rescue efforts. These initial efforts resulted in the team being permanently assigned to the North Atlantic Treaty Organization Combined Air Operations Center (CAOC) on 1 Dec 95, before the 76 SOPS was stood up. This team provided daily GPS accuracy updates and satellite positioning support for theater operations.<sup>7</sup> This was clearly a success story for organic space capability by demonstrating the importance of using organic assets from MAJCOMs to provide quick, reliable space support integrated into their respective staffs.

The presence of a space support team, especially an organic space support team, in-theater provides the direct operational link to space and warfighting. Through direct interface in the AOCs and JAOCs, the teams can more effectively advise and support the theater CINC.

## **Real-world and Exercise Deployments**

Obviously, the best measure of success for determining the effectiveness of operationalization and integration of space is the test of battle. The lessons from Desert Storm have illustrated space was a key contributing factor to the success of the Gulf War, but space support at this time was completely ad hoc. A defined structure now exists and awareness of space contributions is more publicized. The following are a few examples of successful operationalization and integration of space assets.

The success in operation JOINT ENDEAVOR was noted by then Lt. Gen Ryan Joint/Combined Forces Air Component Commander (J/CFACC) supporting Implementation Forces (IFOR), “Outstanding...this is another valuable piece to the puzzle. This team continues to develop innovative ways to apply space support in these operations. You gotta be there to capitalize on the opportunities.”<sup>8</sup>

During a key exercise, in Pacific Air Forces (PACAF), the AFSST team participated in KEEN EDGE 96 to provide space support in the Pacific Theater. While space operator’s play was limited, as is the case with many major exercises, it provided a forum to educate warfighters on capabilities of what space can do for them.<sup>9</sup> This illustrates one of the key aspects to successful operationalization and integration...”you gotta be there.” AFSST is our direct link to warfighting because it brings the human element of space to the theater as a warfighter (although this does not imply acceptance). To affect operationalization and make a capability relevant, most often it has to be witnessed and interacted with. The AFSST provides this link at the tactical level.

Most recently, the effectiveness of operationalization was demonstrated in Operation DESERT FOX during the second night of bombings.

“A four person space support team from the 76 SOPS provided the 28<sup>th</sup> Air Expeditionary Group with satellite imagery for B-1B pre-strike mission planning and post-strike bomb damage assessment. Prior to take-off, B-1B crews familiarized themselves with targeting updates, near real-time intelligence to enhance situational awareness and threat avoidance information – information supplied by the Space Support Team.”<sup>10</sup>

These examples illustrate areas the Air Force and MAJCOMs<sup>11</sup> achieved success in integrating and operationalizing space, but obviously there are always areas of improvement. The next section will address some of the shortfalls AFSST experienced impacting integration and operationalization.

## **Shortfalls**

Despite successes of the AFSST, there are shortfalls. This section analyzes shortfalls in integrating and operationalizing space through AFSST as outlined by the Implementation Plan. It examines how management of manpower, training and equipping lead to shortfalls in integration and what long range implications exist on the overall integration and operationalization of space.

### **Manpower**

A full level commitment is not evident in ensuring manning levels and experiences remain commensurate with the requirements for space support in theater-level operations. Because of cultural barriers and continued emphasis on air-breathing assets, space is not firmly integrated into standard theater military operations. This shortfall impacts the time to learn and develop what space can do for the warfighter in a crisis situation. How do we best get information to the warfighter to operationalize space? AFSST along with their Navy and Army counterparts deploy to crisis spots to make space a routine part of the daily operations. This not only helps build confidence in the space systems and the

information they can provide directly to the warfighter, but brings to light new requirements for space support.<sup>12</sup>

The 76 SOPS continuously experiences manning shortfalls and along with the rest of the Air Force suffer from exceedingly high operations tempo rates to provide support.<sup>13</sup> Part of this problem resides with a lack of commitment on the part of MAJCOMs and NAFs to seed their staffs with space expertise. There appears to be unwillingness by MAJCOMs to convert rated staff billets to space billets to provide an organic space capability. This results in an increase demand on the 76 SOPS to provide teams to support theater-level operations.

Another critical shortfall is the management of space weapons school graduates and rated positions within Air Force Space Command. The space weapons school graduates must be put into theater-level operations where they can maximize the operational contributions of space and make space support organic. This is not happening across the board. There is limited evidence that follow-on assignments to theater-level units or targeted billets are fully materializing. Most MAJCOM rotation occurs one way to AFSPC—to AFSPC with no option to return to the originally sponsoring command which results in virtually no resident theater-level expertise on staff, and a limited identity with theater-level operations.<sup>14</sup>

Also, with the larger looming question of rated management within the Air Force, the AFSST suffers an inability to get rated billets to secure the needed “warfighter sponsorship and operational focus.”<sup>15</sup> Integration and operationalization depends on an aggressive crossflow of space and rated career fields to facilitate a common understanding of warfighting capabilities. This is not happening.

## **Training**

Training and education of space capabilities is a critical aspect to assuring operationalization and integration. The Air Force achieved some success by establishing a space weapons school to train space operators on theater-level operations, yet there are still areas that have not met expectations.

First, AFSST presence in exercises is well documented, but participation and play is extremely limited. Often participation is limited to providing briefings on capabilities and limitations of space support and not on operationally exercising space support. This shortfall is endemic of the overall lack of space sponsorship in the Air Force. Airmen must be educated on space as an operational warfighting element in order to promote understanding of what space support can do.

Some educational fixes instituted include: the creation of the Space Advanced Applications Course at the Space Warfare Center (SWC) to provide an operational overview of space and space support capabilities, and the Air and Space Basic Course at Air University to provide an entry level education. Even with these fixes, there must be a more aggressive effort to bring this information to the tactical level.<sup>16</sup> Once again, seeding other MAJCOMs and NAFs with “space experts” facilitates dialogue, exposure and education of organic space support and eventual integration of space support operations in the daily vernacular of theater-level operations.

Integration in these areas are essential. Career fields and organizations that use space products, rely on space systems or are planning to do so, must be strong advocates and ensure space education and training courses are part of core activities. Similarly, space personnel must become “air and space smart”.

## **Equipping**

Competing for austere dollars in today's defense budget is one of the more difficult battles all military services fight. Space is no exception. Space technology assets are expensive and we have to face the reality that sharing is the way of the future. This will be extremely difficult as space competes against programs such as the F-22 that is culturally accepted.

One of the key capabilities of AFSST is to bring equipment into theater to provide the theater commander the ability to collect, process, and disseminate timely strategic, operational and tactical information on enemy forces and deny enemy access to the same. The AFSST provides the theater CINC the unique capability of reachback to space assets quickly in a hostile environment. It gives the theater access to command and control when other systems may not yet be available for planning and execution. The AFSST normally deploy with a suite of equipment. During initial AOC operations, this may be the only comprehensive tactical display available to the commander to conduct enemy force assessment, bomb damage assessment and theater missile warning.<sup>17</sup>

The Implementation Plan outlined steps for a resource allocation investment strategy to ensure other MAJCOMs are adequately addressing integration of space assets in weapon systems and equipping forces with resident space capability to assume space support roles as space support becomes organic to theater support. This means NAFs and MAJCOMs need to procure the necessary equipment to stand up space support cells without having to depend on the AFFST to deploy the equipment into theater.<sup>18</sup>

The bottomline is the MAJCOMs and the Air Force in general are hesitant to invest in this capability at the risk of sacrificing or limiting other weapon systems. Faced with declining budgets and increasing requirements for space at the theater-level, new

solutions or alternative funding strategies are not being sought after to enhance force projection of space power in support of combat forces. This is one of most significant cultural barriers that affect space support.

This chapter reviewed some of the success and shortfalls of integrating and operationalizing space through the examination of AFSST. The broader context of this analysis reveals a telling picture for the overall effort to integrate and operationalize all aspects of space into warfighting. Space technology for the warfighter at the theater-level is still a novel concept and grasping its importance and relevance to modern warfare is often difficult.

### Notes

<sup>1</sup> James Kitfield, "The Space and Air Force," *Air Force Magazine*, February 1998, 38.

<sup>2</sup> Air Force Doctrine Center. *Air Force Doctrine 2-2*. Maxwell AFB, AL: Air Force Doctrine Center, 23 August 1998, 27.

<sup>3</sup> Major Jeff Gruner. "Weapons School Looks for a Few Good Space Experts," *Guardian Magazine*. December 1996, 23.

<sup>4</sup> Air Force Doctrine Center. *Air Force Doctrine 2-2*. Maxwell AFB, AL: Air Force Doctrine Center, 23 August 1998, 26.

<sup>5</sup> Air Force Space Command, *Concept of Operations for the Air Force Space Support Teams*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1 August 1997, 1.

<sup>6</sup> Air Force Space Command Directorate of Operations. *Air Force Implementation Plan: Integrating and Operationalizing Space into Air Force Operations*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1997, 4.

<sup>7</sup> Major James Perales, "Integrating Space into the Fight." *Space Tactics Bulletin*, Schriever AFB, CO: Space Warfare Center, Winter 97/98, 8.

<sup>8</sup> Major Serie, "AFSST Keeping Peace part of Joint Endeavor." *Space Tactics Bulletin*, Schriever AFB, CO: Space Warfare Center, Spring 96, 8.

<sup>9</sup> *Ibid.*, 11.

<sup>10</sup> USAFnews<usafnews@AFNEWS.AF.MIL, Air Force New Service, 5 Jan 1999, filename 990006, Space Support Teams aid Desert Fox B-1B Missions.

<sup>11</sup> Pacific Air Forces (PACAF), Central Air Forces (CENTAF) United States Air Forces Europe (USAFE), 8<sup>th</sup>/12<sup>th</sup> Air Force (Both under ACC), AMC and AFSOC.

<sup>12</sup> Captain Chris Kinnan, "Space in the Air Operations Center-The Quest for Seamless Integration of Space in Warfighter Operations." *Space Tactics Bulletin*, Schriever AFB, CO: Space Warfare Center, Fall 95, 7.

## Notes

<sup>13</sup> 76 Space Operations Squadron. “The Air Force Space Support Team (AFSST),” *Mission Briefing*, Schriever AFB, CO: 76<sup>th</sup> Space Operations Squadron, 29 Jan 96, slide 3.

<sup>14</sup> Major General William G. Jones, USAF (ret). *White Paper on Space*. 1997, 17.

<sup>15</sup> General Michael P.C. Carns USAF (ret). “Spacecast 2020-A Commentary,” *Airpower Journal*. Summer 1995, 6.

<sup>16</sup> Air Force Space Command Directorate of Operations. *Air Force Implementation Plan: Integrating and Operationalizing Space into Air Force Operations*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1997, 4.

<sup>17</sup> 76<sup>th</sup> Space Operations Squadron, *AFSST Lesson Plan*, Schriever AFB, CO: 76 Space Operations Squadron, 13 Jun 1997, 8.

<sup>18</sup> Air Force Space Command Directorate of Operations. *Air Force Implementation Plan: Integrating and Operationalizing Space into Air Force Operations*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1997, 4.

## Chapter 5

### Conclusions

*To develop anything, the underlying thought and reason must govern and then the organization must be built up to meet it.*

Brigadier General William “Billy” Mitchell

We are now on the brink of another unique revolution as information superiority/warfare could become the premier conflict of the future. As the early Airpower theorists such as Douhet, Mitchell and Trenchard established a testimony to Military Technological Revolution (MTR) and how it can successfully be integrated into all facets of military operations, so space now faces that same challenge. We can either stand by and watch or become actively engaged.

History offers important lessons, which can prove useful in developing an executable path for the future. It is important to recognize that spacepower in the Air Force is evolving much like the airplane. In the early years of aviation, reconnaissance represented the dominant air power role. As the operational and tactical advantage of surveying from the high ground across a theater of operations was demonstrated, air superiority and self-protection became fundamental necessities as surface commanders attempted to exploit enemy orders of battle while denying access to the opponent. Space is evolving along a similar path. In the early years, cold war intelligence-driven reconnaissance represented the dominant role with later capabilities to communicate,

navigate and provide remote sensing entering the inventory to enhance terrestrial operations. Space is currently at the threshold of evolving into the dominant warfighting influence.<sup>1</sup>

Overall, we witnessed significant progress in operationalizing and integrating space since Desert Storm. Particularly, the introduction of AFSST into theater-level operations has bridged the gap on making space operationally relevant to theater-level operations. Yet, there is still reluctance by the rest of the Air Force community to readily accept space as an integral component of warfighting.

## **Recommendations**

In order to impact a cultural shift, space operators need to be present in all aspects of theater-level operations. This is key to securing acceptance of space capabilities as a warfighting component. Obviously, the current vision of our Air Force doctrine has facilitated this process, but to quote Carl Builder again:<sup>2</sup>

“It is deeds, not the words that ultimately define the vision. If leadership is perceived to represent special interests within the institution, then those interests, even more than the institution’s mission or vision statements, will be seen by many as shaping the future”.

Leadership is critical to breaking down the existing cultural mindset that facilitates acceptance. The best way to make this happen is by inserting space support personnel into day-to-day operations and making space support organic within the staffs of the combatant NAFs and MAJCOMs.

Secondly, personnel management must be more closely scrutinized. After all, people make the difference in changing and bridging cultural barriers. We need to seed the combatant commands with space personnel and continue the push for organic space

capability within these MAJCOMs and NAFs. Also, the Air Force must reassess utilization of rated personnel with theater-level experience to place them in positions within space career fields that influence the operations and requirements process. This aggressive crossflow needs to occur at all levels within the Department of Defense, from the Joint Staff to the Functional and Geographic CINCs staff to the Air Staff, MAJCOMs, NAFs and Wings, to ensure space is imbedded in daily operations. This will also facilitate a better understanding of space capabilities.

Funding priorities will continue to play a pivotal role in determining the future of space. As General Howell M. Estes III, former USCINCSpace stated, “We will never become an air and space force if we do not invest greater sums in space. Space must expand and become a larger part of the Air Force budget every year. It has to be this way because it is unlikely that anyone is going to give the Air Force a bigger piece of the pie to cover our expansion in space.”<sup>3</sup> Recent availability of surplus budget dollars and a renewed emphasis on readiness may provide space the unique opportunity to capitalize on expansion and modernizing to meet the future threats. The Air Force needs to decide now if it wants to actively pursue additional funding to secure space force power projection into the next millennium. Future technological advances in any weapon system will come at a premium cost. The Air Force needs to decide now on how it will structure an investment strategy for the future. The choices facing the Air Force are to continue investing in modernization of existing air breathing assets or dedicating more of its total obligation authority in space capabilities and the future. The choice does not have to imply the elimination of one or the other.

Finally, education. Obviously, we need to get the word out to inform, to build dialogue, and to stimulate debate. Space is an ongoing issue in all of its aspects—vision, utilization, its roadmap, its military value and its operational uses. This can be accomplished through continued emphasis of doctrine development and education at Air University. Also, increasing emphasis on space operator participation in major exercises will pay great dividends. Future scenario development in exercises must not exclusively focus on traditional threats, but rather on how in an era of diminished forward basing, space assets can increasingly represent forward presence. Lieutenant General Roger DeKok best described this during the 1999 Doctrinal Symposium when asked about space support, “Augmenting space support to theater within 24 hours is not the way to do business. Space capabilities need to be understood by the JFC and JFACC and organic to all theater-level operations”.<sup>4</sup>

## **Summary**

Currently, space forces are fundamental to modern military operations. They are playing a central role in the on-going revolution in warfare because of the unique capabilities for gathering, processing and disseminating information. In particular, space systems are force multipliers that are increasingly important for sustaining an effective-level of US defense capability as overall force structure is downsized and restructured.<sup>5</sup>

The reality of the matter is that the Air Force will still continue to be comprised of and divided by functional specialties because we view ourselves in terms of weapon systems. The evolution of space provides the Air Force the unique opportunity to redefine themselves as “an aerospace force”, engaged as a team to support and accomplish missions and taskings directed by the National Command Authorities. What

makes this especially difficult now is the transition of a community with limited to no combat experience in theater-level combatant support and operations tempo.<sup>6</sup> We must utilize the experiences of the evolution of AFSST as building blocks to truly achieve a fully integrated and operational space force and learn from our lessons of the past as air power asserted itself as a major force multiplier in the early part of the century.

The thesis of this paper contends that failure on the part of the Air Force to recognize and exploit the critical capabilities space provides to warfighting is driven by a cultural barrier. This resistance in making a cultural shift has inhibited efforts to fully operationalize and integrate space into theater-level operations. To overcome these cultural barriers, the future needs to consider several courses of action to make space culturally acceptable. These courses of action must include more emphasis on integrated operations, cooperative partnering in planning, programming and budgeting, concerted educational efforts at all levels within the Air Force and a more equitable mix of senior leadership (especially at the 4-Star level) reflecting all interest areas within the Air Force. The key to surviving in the modern era demands that we adopt a different approach to creating our “vision” by ensuring leadership is representative of all interests in the Air Force. Our brief history has demonstrated that weapon system focus dictates our doctrine and creates an atmosphere of “self-serving elitism”.<sup>7</sup> The time for change is now.

### Notes

<sup>1</sup> Major General William G. Jones, USAF (ret). *White Paper on Space*. 1997, 1.

<sup>2</sup> Carl H. Builder, *The Icarus Syndrome*. Transaction Publishers, New Brunswick, 1994, 226.

<sup>3</sup> James Kitfield, “The Space and Air Force,” *Air Force Magazine*, February 1998, 36.

## Notes

<sup>4</sup> This quote was taken during a question and answer period during the 1999 Doctrinal Symposium held at Maxwell AFB, AL on 1 and 2 March 1999.

<sup>5</sup> Paul G. Kaminski, "Space Forces Essential to Modern Military," *Defense Issues*, Volume 10 Number 4. 23 March 1995, 7.

<sup>6</sup> Major General William G. Jones, USAF (ret). *White Paper on Space*. 1997, 21.

<sup>7</sup> Carl H. Builder, *The Icarus Syndrome*. Transaction Publishers, New Brunswick, 1994, 227.

## *Glossary*

ACC	Air Combat Command
AFSOC	Air Force Special Operations Command
AFSPC	Air Force Space Command
AFSST	Air Force Space Support Team
AMC	Air Mobility Command
AOC	Air Operations Center
AOR	Area of Responsibility
ATO	Air Tasking Order
CAF	Combatant Air Forces
CAOC	Combined Air Operations Center
CENTAF	Central Air Forces
CINC	Commander-in-Chief
CJCS	Chairman Joint Chiefs of Staff
COMAFSPACE	Commander Air Force Space Forces
CSAF	Chief of Staff of the Air Force
C2	Command and Control
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance
GPS	Global Positioning System
INMARSAT	International Maritime Satellite
IFOR	Implementation Forces
J/CFACC	Joint/Combined Air Component Commander
JDISS	Joint Deployable Intelligence Support System
JFACC	Joint Forces Air Component Commander
JFC	Joint Forces Commander
JSST	Joint Space Support Team
JTF	Joint Task Force
LRP	Long Range Plan
NAF	Numbered Air Force
MAJCOM	Major Command
MTR	Military Technological Revolution
OPCON	Operational Control
PACAF	Pacific Air Forces
SECAF	Secretary of the Air Force
SECDEF	Secretary of Defense
SLO	Space Liaison Officer
SOC	Space Operations Center
SOPS	Space Operations Squadron

SW	Space Wing
SWC	Space Warfare Center
SWS	Space Warning Squadron
TACON	Tactical Control
TSOC	Theater Support Operations Cell
USAF	United States Air Force
USAFE	United States Air Force Europe
USCINCSpace	Commander-in-Chief, United States Space Command
USSPACECOM	United States Space Command

## ***Bibliography***

### **Primary Sources**

- Air Force Doctrine Center. *Air Force Doctrine 2-2*. Maxwell AFB, AL: Air Force Doctrine Center, 23 August 1998.
- Air Force Space Command Directorate of Operations. *Air Force Implementation Plan: Integrating and Operationalizing Space into Air Force Operations*. Peterson AFB, CO: Headquarters Air Force Space Command Directorate of Operations, 1997.
- Builder, Carl H. *The Icarus Syndrome*. Transaction Publishers, New Brunswick, 1994.
- Carns, Michael P.C. Carns, General USAF (ret). "Spacecast 2020-A Commentary," *Airpower Journal*. Summer 1995.
- Gruner, Jeff, Major. "Weapons School Looks for a Few Good Space Experts," *Guardian Magazine*. December 1996
- Headquarters Air Force Space Command. *Concept of Operations for Air Force Space Support Teams*. 1 Aug 1997.
- Headquarters Air Force Space Command, Directorate of Plans. *Long Range Plan*. March 1998.
- Headquarters Air Force Space Command. *Air and Space Operational Primer ("Little Red Book")*. 8 Apr 1997
- Spire, David N. *Beyond Horizons: A Half Century of Air Force Leadership*. U.S. Government Printing Office, 1997.
- Headquarters Fourteenth Air Force. *Command and Control of AFSPACE Forces: A White Paper to Articulate COMAFSPACE's Vision*. 20 April 1998.
- Jones, William G, Major General USAF (ret). *White Paper on Space in the USAF*. 1997.
- Kaminski, Paul G. "Space Forces Essential to Modern Military," *Defense Issues, Volume 10 Number 4*. 23 March 1995.
- Kinnan, Chris, Captain. "Space in the Air Operations Center-The Quest for Seamless Integration of Space in Warfighter Operations." *Space Tactics Bulletin*, Schriever AFB, CO: Space Warfare Center, Fall 95.
- Lynch, David. "Spacepower Comes to the Squadron," *Air Force Magazine*, September 1994.
- Perales, James, Major. "Integrating Space into the Fight." *Space Tactics Bulletin, Space Warfare Center*, Winter 97/98.
- Serie, Major. "AFSST Keeping Peace as part of Joint Endeavor." *Space Tactics Bulletin*, Schriever AFB, CO: Space Warfare Center, Spring 96, 8.
- Schultz, Richard H. Jr. and Pfaltzgraff, Robert L. Jr. *The Future of Air Power in the Aftermath of the Gulf War*. Maxwell AFB, AL, Air University Press, 1992.
- USAF Weapons School, Space Division. *A Space Weapons Officer's Guide to the Universe*. 25 Feb 1997.

USAFnews<usafnews@AFNEWS.AF.MIL, Air Force New Service, 5 Jan 1999, filename 990006, Space Support Teams aid Desert Fox B-1B Missions.

United States Congress, House Committee on National Security, *Title 10*. United States Government Printing Office, 31 December 1996.

Wasserman, Robert A, Captain. USAF Weapons School Class 96B. *Student Paper: Space Support to a Theater Air Operations Center*. 1 December 1996.

76<sup>th</sup> Space Operations Squadron, *AFSST Lesson Plan*, Schriever AFB, CO: 76 Space Operations Squadron, 13 Jun 1997.

76 Space Operations Squadron. "The Air Force Space Support Team (AFSST)," *Mission Briefing*, Schriever AFB, CO: 76<sup>th</sup> Space Operations Squadron, 29 Jan 1996.

## Secondary Sources

Air Force Doctrine Center. *Air Force Doctrine Document 2*, Maxwell AFB, AL, Air University Press. August 1998.

Department of the Air Force. *Global Engagement: A Vision for the 21<sup>st</sup> Century*. U.S. Government Printing, Washington D.C., 1995.

Hawley, Richard E. Hawley, General. *Air Combat Command: Charting the Course for Global Engagement: A Speech Presented to the Air Force Association Symposium*. 30 January 1997.

Joint History Office. *The History of the Unified Command Plan*. Office of the Chairman of the Joint Chiefs of Staff, Washington D.C., Feb 1995.

Meyers, Richard B, General. *Speech to the National Guard Association of the United States*. 6 September 1998.

Ryan, Michael E, General. *Expeditionary Aerospace Force for America: Keynote Address to the National Air Force Association Convention*. 14 September 1998.

United States Space Command, Directorate of Plans. *Long Range Plan*. Peterson AFB, CO. March 1998.

Vesley, David, Lieutenant General. *Speech to 45<sup>th</sup> Space Wing on AEF Space Capabilities and Resources*. 31 July 1998.

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